Comparison of Aspergillus species-complexes detected in different environmental settings

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ABSTRACT

Purpose: Samples from different environmental sources were screened for the presence of Aspergillus, and the distribution of the different species-complexes was determined in order to understand differences among that distribution in the several environmental sources and which of these species complexes are present in specific environmental settings.

Methods: Four distinct environments (beaches, poultries, swineries and hospital) were studied and analyzed for which Aspergillus complexes were present in each setting. After plate incubation and colony isolation, morphological identification was done using macro- and microscopic characteristics. The universal fungal primers ITS1 and ITS4 were used to amplify DNA from all Aspergillus isolates, which was sequenced for identification to species complex level. SPSS v15.0 for Windows was used to perform the statistical analysis.

Results: Thirty-nine isolates of Aspergillus were recovered from both the sand beach and poultries, 31 isolates from swineries, and 80 isolates from hospital environments, for a total 189 isolates. Eleven species complexes were found total. Isolates belonging to the Aspergillus Versicolores species-complex were the most frequently found (23.8%), followed by Flavi (18.0%), Fumigati (15.3%) and Nigri (13.2%) complexes. A significant association was found between the different environmental sources and the distribution of the several species-complexes ($p<0.001$); the hospital environment had a greater variability of species-complexes than other environmental locations (10 in hospital environment, against nine in swine, eight in poultries and seven in sand beach). Isolates belonging to Nidulantes complex were detected only in the hospital environment, whereas the other complexes were identified in more than one setting.

Conclusion: Because different Aspergillus complexes have different susceptibilities to antifungal drugs, and different abilities in producing mycotoxins, knowledge of the species-complex epidemiology for each setting may allow preventive or corrective measures to be taken toward decreasing professional workers or patient exposure to those agents.